

REMARKS

Applicants have amended their claims in order to further clarify the definition of various aspects of the present invention. Specifically, Applicants have amended claim 1 to incorporation therein the subject matter of both claims 10 and 11 in the alternative, and to recite that the mold has formed on a surface thereof fine concavities and convexities. Claims 10 and 11 have been amended in light of amendments to claim 1.

Applicants respectfully traverse the rejection of their claims under the second paragraph of 35 USC 112, set forth in Item 5 on page 3 of the Office Action mailed February 8, 2007, particularly insofar as applicable to the claims as presently amended. Thus, the basis for this rejection under the second paragraph of 35 USC 112 is that it is unclear as to which surface, that is, the surface of the substrate or the surface of the mold, has the fine concavities and convexities. As presently amended, it is respectfully submitted that it is clear that the mold has formed on a surface thereof fine concavities and convexities; and, accordingly, it is respectfully submitted that the basis for rejection of the claims under the second paragraph of 35 USC 112, is moot.

Applicants respectfully submit that all of the claims presented for consideration on the merits by the Examiner patentably distinguish over the teachings of the prior art applied by the Examiner in rejecting claims in the Office Action mailed February 8, 2007, that is, the teachings of U.S. Patent No. 3,737,274 to Coffin, et al., under the provisions of 35 USC 103.

It is respectfully submitted that this reference as applied by the Examiner would have neither taught nor would have suggested such a nanoprint apparatus as in the present claims, having the recited substrate and mold pressed to each other

through the intermediary of a buffer member, and wherein the apparatus also includes a mechanism for successively replacing the buffer member with a new one after heating and pressing, with the buffer member (a) being interposed between the mold and a head having a press surface, adjacent a surface of the mold opposite to the surface of the mold having fine concavities and convexities, or (b) is interposed between the substrate and a stage for carrying the substrate. See claim 1.

As will be shown in the following, it is respectfully submitted that Coffin, et al. does not disclose, nor would have suggested, apparatus including the buffer member, much less a mechanism for successively replacing the buffer member with a new one after heating and pressing; and, moreover, even as interpreted by the Examiner, including the buffer member, the teachings of Coffin, et al. would have neither disclosed nor would have suggested structure including positioning of the buffer member, (a) interposed between the mold and a head having a press surface, adjacent a surface of the mold opposite to the surface of the mold having fine concavities and convexities, or (b) interposed between the substrate and a stage for carrying the substrate.

Moreover, it is respectfully submitted that the teachings of the applied reference would have neither disclosed nor would have suggested such nanoprint apparatus as in the present claims, having features as discussed previously in connection with claim 1, and, moreover, wherein the buffer member is larger than a pattern forming area of the mold, but smaller than an external shape of the substrate and the external shape of the mold (see claim 2); and/or material of the buffer member, as in claims 8 and 9; and/or wherein the buffer member is positioned interposed between the substrate and the stage for carrying the substrate (see claim 11).

The Examiner is thanked for the indicated allowability of subject matter of claim 10, set forth in Item 6 on page 4 of the Office Action mailed February 8, 2007. As indicated previously, and as will be shown infra, as independent claim 1 should be allowed, it is respectfully submitted that claim 10 need not be set forth in independent form in order to be allowed.

The invention being considered on the merits in the above-identified application is directed to a nanoprint apparatus, for making a fine structure on a substrate with the use of a mold having a heating and pressing mechanism.

As described in the paragraph bridging pages 2 and 3 of Applicants' specification, there has been proposed a technology for fabricating a fine pattern using a mold having concavities and convexities defining a predetermined pattern for forming a fine pattern on a substrate. However, previously proposed techniques do not have sufficient accuracy in transferring a pattern, for fabricating a fine pattern; and, accordingly, it is desired to provide an apparatus capable of transferring a pattern with a higher degree of accuracy, useful, for example, in manufacturing semiconductor devices.

Against this background, Applicants provide a nanoprint apparatus having desired accuracy. Applicants have found that by utilizing a buffer material as in the present claims, with the buffer material being positioned relative to the mold and the pressing head, or relative to the substrate (having the fine structure formed thereon) and stage for holding the substrate, and with the buffer material being successively replaced using a mechanism as recited in the present claims, such greater accuracy of the fine pattern is obtained. In particular, through use of the buffer member as in the present claims, especially by automatically replacing the buffer member, e.g., having been deformed by heating and pressing, with a new buffer member, stress

concentration in an end part of the substrate can be prevented so as to uniformly apply a pressure only over the concave and convex area of the mold, with unevenness among the formed structures being decreased. Such accuracy of transcription can be enhanced through use of a buffer member configured as in the present claims, smaller than the external shape of the substrate and the external shape of the mold, but larger than a pattern forming area of the mold. Note, for example, the paragraph bridging pages 14 and 15 of Applicants' specification. See also the paragraph bridging pages 30 and 31 of Applicants' specification.

Coffin, et al. discloses apparatus for producing a finished surface on resin sheet material, the apparatus including a C-frame press or the like, generally designated P (note Fig. 1), located immediately adjacent to the end of a precipitator 10, in which the sheet material or work (generally designated W) is formed. After leaving the precipitator 10, the sheet material W is supported on a stationary support member or press platen 12, and positioned above the support member 12 is a movable upper platen 14, which carries at its lower end a steel plate 16. Attached to the steel plate 16 is a back-up member or press platen 24, and positioned against the back-up member 24 is a resilient pressing member 28. Adjacent the left side of the press P is a roll 30 which carries the polishing or finishing web 32, which in a preferred embodiment is a glass fiber belt having a fluorocarbon coating such as a polytetrafluoroalkylene thereon. Polishing web 32 passes beneath the resilient pressing member 28, and to a take-up roll 34; and web 32 contacts the sheet material W, providing a desired finish to the sheet material. Note, for example, from column 1, line 63 through column 2, line 28. Note also column 2, lines 39-54; and column 2, line 67 through column 3, line 7.

Initially, contrary to the contention by the Examiner, it is respectfully submitted that web 32 in Coffin, et al. qualifies as the surface forming the finish on the work W, and is not a buffer member as in the present claims. It is respectfully submitted that the structure of Coffin, et al., including web 32, would have neither taught nor would have suggested such buffer member as in the present claims, having the mechanism for replacement of the buffer member. Thus, Applicants respectfully traverse the contention by the Examiner in the second paragraph of Item 3, on page 2 of the Office Action mailed February 8, 2007, that Coffin, et al. teaches a press apparatus having, inter alia, an “intermediate buffer member (32)”.

To the contrary, it is respectfully submitted that in the apparatus of Coffin, et al., resilient pressing member 28 corresponds to the buffer member of the present invention. However, it is respectfully submitted that Coffin, et al. does not disclose, nor would have suggested, apparatus as in the present claims, including a mechanism for successively replacing the buffer member with a new one after heating and pressing, where resilient pressing member 28 of Coffin, et al. is considered a buffer member.

However, even assuming, arguendo, that the polishing or finishing web 32 qualified as a “buffer member”, it is respectfully submitted that Coffin, et al. would have neither taught nor would have suggested the presently claimed invention, including wherein the buffer member (a) is interposed between the mold and a head having a press surface, adjacent a surface of the mold opposite to the surface of the mold having fine concavities and convexities, or (b) is interposed between the substrate and a stage for carrying the substrate. That is, clearly in Coffin, et al., the polishing or finishing web 32 must be positioned between the resilient pressing member 28 and the sheet material W; and it is respectfully submitted that the

structure disclosed in Coffin, et al. would have taught away from the presently claimed structure, including, inter alia, positioning of the buffer member.

Especially in view of the different function of web 32 in Coffin, et al. and the buffer member of the present invention, Applicants respectfully traverse the contention by the Examiner in the first paragraph on page 3 of the Office Action mailed February 8, 2007, as to equivalent materials; the Examiner has not established the it would have been obvious to use materials in the present claims as web 32 of Coffin, et al., to provide a desired finish to the sheet material.

Applicants respectfully traverse the conclusion by the Examiner in the second paragraph on page 3 of the Office Action mailed February 8, 2007, that the sizes are a matter of choice. Such conclusion, without evidence or reasoning in support thereof, is improper. See In re McKellin, 188 USPQ 428 (CCPA 1976). Such conclusion without evidence or reasoning in support thereof is particularly inappropriate under the present circumstances, where sizes as in the present claims provide advantages for the present invention, as discussed previously.

In view of the foregoing comments and amendments, reconsideration and allowance of all claims presently in the application are respectfully requested.

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To the extent necessary, Applicants petition for an extension of time under 37 CFR 1.136. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to the Deposit Account of Antonelli, Terry, Stout & Kraus, LLP, Account No. 01-2135 (Docket No. 500.43682X00) and please credit any excess fees to such Deposit Account.

Respectfully submitted,

ANTONELLI, TERRY, STOUT & KRAUS, LLP

By William I. Solomon/
William I. Solomon
Registration No. 28,565

WIS/ksh
1300 N. Seventeenth Street
Suite 1800
Arlington, Virginia 22209
Tel: 703-312-6600
Fax: 703-312-6666